Improving Attitudes and Beliefs of Cervical Cancer Screening Guidelines Through an Evidence-based Quality Improvement Project

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PART II: DNP PROJECT PROPOSAL

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Abstract

Introduction/Purpose

Cervical cancer is highly preventable, in part, due to its long pre-invasive stage and the availability of screening with the Papanicolaou (Pap) test and high-risk human papillomavirus (hrHPV) testing (cotest). The purpose of this project was to identify and improve healthcare provider (HCP) attitudes, beliefs, and knowledge of the most updated screening guidelines.

Methods

Data were collected from six HCPs using an online pre- and post-intervention cross-sectional survey. The participants were surveyed before an educational session that detailed the most recent United States Preventive Services Task Force (USPSTF) cervical cancer screening guidelines, and again two months post-intervention.

Results

When the survey was scored pre- and post-intervention, the majority (two-thirds) of the participants improved their score. Sixty-seven percent of HCPs reported use of cotesting for screening and recommended a greater than three-year screening interval in women with normal cotest results (unchanged after intervention). HCPs perceived greater encouragement for cotesting and extending the screening interval from national-level sources than from their practice administration (pre- and post-intervention). An important barrier (67%) to extending the interval included concerns about patients losing contact with the medical system (50% at baseline).

Conclusion

Improvements in the majority of HCP survey scores from pre- to post-intervention underscores the clinical significance of this project. Breakdown of the item specific results may reflect a perceived lack of support from administration and patients. Further education of HCPs, staff, and patients regarding the implications of hrHPV testing, as well as increased administrative support will be an important component in

the clinic-wide implementation of national guidelines.

Keywords: cervical cancer screening, HPV test, protocols/practice guidelines, HCP attitudes/beliefs/perceptions

Improving Attitudes and Beliefs of Cervical Cancer Screening Guidelines Through an Evidence-based Quality Improvement Project

Cervical cancer is one of the most common gynecological cancers in the United States (US). It is highly preventable, in part, due to its long pre-invasive stage, the availability of cervical cancer screening with the Pap test, the availability of a vaccine to prevent infection caused by human papillomavirus (HPV), and the effectiveness of current treatment options for pre-cancerous lesions (Moore de Peralta et al., 2015; Silver & Kobrin, 2020). The incidence of cervical cancer in South Carolina (SC) mirrors the US average; however, mortality is higher, and cervical cancer-related health disparities in SC are among the greatest in the nation (Adams et al., 2020). Of the patients who receive care at Community Medicine Foundation, Inc. (CMF) doing business as North Central Family Medical Center (NCFMC), a federally qualified health center (FQHC), 93% are low-income (below 200% of the Federal Poverty Level), and 66% self-identify as an Ethnic or Racial Minority (Capital Link, 2016). Women who are uninsured and low-income suffer disproportionately regarding cervical cancer morbidity, mortality, and late-stage diagnosis, while receiving cervical cancer screening less often than recommended (Roland et al., 2013). Ensuring HCPs know the most current cervical cancer screening guidelines will help bridge the health disparities gap, improve attitudes among HCPs regarding screening intervals, and screen women more thoroughly and appropriately (Alber et al., 2018; Hass et al., 2015; Hills et al., 2015; Roland et al., 2013; Teoh et al., 2015).

Background

The revision of the American Society for Colposcopy and Cervical Pathology (ASCCP) 2019 Risk-Based Management Consensus Guidelines expands upon the risk-based approach initially introduced in 2012 (Schiffman et al., 2020). The change was based upon the need for simplicity and consistency in clinical guidelines in the era of technological advancements in cervical cancer screening methods, the need to determine follow-up based on the patient's risk of developing cervical cancer, and the need to allow greater time between updates (Schiffman et al., 2020). The 2019 guidelines further align abnormal cytology and

cervical pathology management recommendations with the current understanding of HPV natural history and cervical carcinogenesis, with the key difference being a change from test results-based algorithms to risk-based guidelines (Perkins et al., 2020).

The US Preventive Services Task Force (USPSTF) makes recommendations about the effectiveness of preventive services in those without increased risk and recently updated their clinical recommendations on cervical cancer screening in 2018 (Curry et al., 2018). After review of the evidence from randomized control trials (RTCs) and decision modeling studies, the authors determined that screening with cytology alone is less sensitive for detecting cervical abnormalities, precancerous cervical lesions, and cervical cancer than screening with high-risk HPV (hrHPV) alone or in combination with cytology (Curry et al., 2018). This prompted the change in recommendation to include primary hrHPV testing every five years as an option for cervical cancer screening in women aged 30 to 65 years, in addition to screening with cytology every three years or screening with cytology in conjunction with hrHPV testing (cotesting) every five years (Curry et al., 2018). USPSTF concludes that the benefits of screening with these methods, to include screening women aged 21 to 29 years every three years with cytology alone, substantially outweigh the harms (Curry et al., 2018).

Alber et al. (2018) found that low provider adherence to guidelines, and overuse of cervical cancer screening results in higher healthcare costs while providing minimal benefits to patients. Overuse puts patients who were otherwise known to be at a low risk of developing invasive cancer at a higher risk of false-positive results. This has been shown to cause unnecessary intervention, such as colposcopies and/or biopsies with results (to include pain and disease-specific distress) as disadvantageous as underscreening, which has prompted the spacing of the screening timeline (Alber et al., 2018; Curry et al., 2018).

Although advances in testing and the implementation of widespread cervical cancer screening throughout the US have resulted in a significant decrease in the number of deaths caused by cervical cancer (Curry et al., 2018; Fontham et al., 2020), cervical cancer mortality in SC is significantly higher than in the

US, as SC ranks 14th in the nation (Adams et al., 2020; SCDHEC, 2019; USCDV). Cervical cancer incidence in SC mirrors that of the US but is 22% higher for African American women in the state, who are twice more likely to die from cervical cancer than their Caucasian counterparts (SCDHEC, 2019). SCDHEC (2019) found that women aged 21-65 years with low income are less likely to have had a pap test within the past three years than their counterparts with higher pay, leading to the inadequate screening of all women, especially those most at risk of developing cervical cancer.

The population served at NCFMC is mostly low income and identify as an ethnic or racial minority. Many of the patients will forego preventive screening due to the inability to pay (Capital Link, 2016). To combat this, NCFMC utilizes a "sliding fee", where eligible patients receive care and services (laboratory studies, imaging studies, and prescription medication) at a discounted price (D. Johnson, personal communication, July 30, 2020). NCFMC is also recognized as an FQHC and receives funding from the Health Resources and Services Administration (HRSA) and the Best Chance Network (BCN), which is the SC Breast and Cervical Cancer Early Detection Program that provides funds to perform cervical and breast cancer screening. However, the percentage of women aged 23-64 years with appropriate cervical cancer screening (51%) based on the most recent screening guidelines, continues to fall below the Healthy People 2030 baseline target of 80.5% in women aged 21-65 years (Healthy People 2030, 2020; UDS, 2020). The largest contributors to missing this goal include missed opportunities to enroll eligible patients in BCN, the lack of a screening clinical practice guideline or protocol, inconsistencies in following the updated screening guidelines by clinic HCPs, minimal support staff, and high HCP turnover (D. Bennett, personal communication, July 23, 2020).

Problem Statement

Cervical cancer is mostly preventable due to advances in screening tests and pre-cancerous treatment options. Adherence to cervical cancer screening guidelines is low among HCPs due to a lack of awareness of a change, disagreement with the updated guideline, or fear of missing a more significant diagnosis because of

the recommended screening interval (Alber et al., 2018). Lack of HCP knowledge coupled with preexisting HCP beliefs and attitudes prevent utilization of the most updated cervical cancer screening guidelines (Alber et al., 2018; Roland et al., 2013; Teoh et al., 2015). Adopting a cervical cancer screening clinical practice guideline or protocol will enable HCPs to identify all eligible patients and screen them according to the most updated recommendations.

Organizational "Gap" Analysis of Project Site

The gap analysis of cervical cancer screening at NCFMC identified several areas that require significant improvement. There is not an approved clinical practice guideline or standard procedure for routine cervical cancer screening utilized by the facility. The HCPs utilize multiple screening guidelines and do not routinely perform chart reviews to identify patients eligible for screening, to include those suitable for BCN. Inconsistencies exist among HCP documentation, coding, and billing of cervical cancer screening visits, test ordering, and the follow-up of abnormal screening results. Many clinical procedures are based on individual HCP preference due to high HCP turnover and a lack of clinical support staff and team leadership (J. Chua, personal communication, July 23, 2020). Developing a protocol outlining specific procedures, educating HCPs and support staff on the most up-to-date evidence, and implementing ongoing process improvement will enable modeling of best practice and the provision of compassionate, evidence-based care to this vulnerable patient population (Doherty et al., 2018; Haas et al., 2015; Hills et al., 2015).

Review of the Literature

This systematic analysis utilized a combination of terms related to cervical cancer screening to include cervical cancer, cervical cancer screening, guidelines, HPV test, protocols/practice guidelines, and HCP attitudes, beliefs, or perceptions, to achieve a comprehensive search within each of the following databases: CINAHL (44 records), EBSCOhost (203 records), PubMed (11 records), and Cochrane Database Systematic Reviews/Cochrane Central Register of Controlled Trials (28 records). Additional filters utilized: records published between January 2015 and August 2020, peer-reviewed/academic journals, and full-text articles

available in English. After the initial search, reference lists from eligible articles were reviewed to identify any additional articles for review.

Inclusion criteria for eligible articles were evaluation of HCP beliefs/attitudes related to cervical cancer and HPV screening, evaluation or discussion of quality improvement projects to improve cervical cancer and HPV screening, cervical cancer screening clinical practice guidelines, and cervical cancer screening recommendations. Articles were excluded if they examined general cancer screening but not cervical cancer screening specifically, did not mention cervical cancer screening guidelines, and were conducted outside of the US. Articles were screened and selected based on a brief evaluation of article titles and abstracts to determine eligibility based on the inclusion of cervical cancer screening, a thorough evaluation of titles and abstracts for all inclusion and exclusion criteria, and selection of eligible articles. A total of 286 records were identified through the database search, and 13 were utilized during this review based on the inclusion criteria (evaluation of HCP beliefs/attitudes related to cervical cancer and HPV screening, evaluation or discussion of quality improvement projects to improve cervical cancer and HPV screening, cervical cancer screening clinical practice guidelines, and cervical cancer screening recommendations). The articles included clinical practice guidelines, systematic reviews, observational studies, cohort studies, qualitative/descriptive studies, and mixed methods research.

High-risk Human Papillomavirus (hrHPV)

Incorporating hrHPV testing into the cervical cancer screening protocol at Kaiser Permanente Northern California (KPNC) in 2003 facilitated the most extensive clinical HPV testing in the world by screening over 1 million women to date. This comprehensive testing formed the basis for regulatory and clinical guideline approval to include hrHPV testing in conjunction with cytology for routine screening of women aged 30 and older (Castle et al., 2017; Katki et al., 2011). This landmark KPNC population-based study enabled researchers to determine that the risk of cervical intraepithelial neoplasia (CIN) 2/3, adenocarcinoma in situ (AIS), and total cancer is higher in women who were positive by hrHPV and negative

by cytology; suggesting that hrHPV testing has superior sensitivity compared to cytology alone for screening (Castle et al., 2017). A single negative hrHPV test was sufficient to predict future disease, while negative cytology provided no additional reassurance. Therefore, women negative by both hrHPV and cytology had a low risk of cervical cancer, supporting lengthening the screening interval for average-risk women to five years (Katki et al., 2013). The introduction of primary hrHPV testing, where abnormal results reflex to cytology, has the potential for equivalent or superior effectiveness to the available cytology-based screening tests and was approved by the Food and Drug Administration (FDA) for use in women 25 years and older (Huh et al., 2015).

Clinical Practice Guideline Update

Cervical cancer screening guidelines have undergone a drastic change over the past decade, due to the discovery that testing for hrHPV, which causes nearly all cervical cancers and their precursor lesions (Castle et al., 2017), is more sensitive than cytology alone. The most notable change in screening guidelines occurred when the USPSTF (2018) made the additional recommendation that average-risk women aged 30-65 years be screened with hrHPV testing alone every five years as an alternative to screening with cytology alone every three years, or with cotesting every five years. ASCCP, the American College of Obstetricians and Gynecologists (ACOG), the Society of Gynecologic Oncology (SGO), the American Society of Cytopathology (ASC), and the College of American Pathologists (CAP) also endorse the recommended change to primary hrHPV testing every five years in women aged 30-65 years (ACOG, 2016). The American Cancer Society (ACS) has expounded upon this recommendation to suggest: the preferred screening method is primary hrHPV testing every five years (with cotesting and cytology alone as acceptable screening methods in areas where FDA approved primary testing is not available); cervical cancer screening begins at age 25, rather than age 21; primary hrHPV testing (cotesting and cytology alone if necessary) starts at age 25 rather than age 30; and that options for screening with cotesting and cytology alone be phased out as access to primary hrHPV testing becomes widely available (Fontham et al., 2020). In addition to screening guideline

changes, ASCCP (2019) has updated its management consensus guidelines for abnormal cervical cancer screening tests and cancer precursors to reflect risk-based guidelines instead of utilizing test results-based algorithms due to increasing evidence of the impact of hrHPV.

Evidence-based Interventions

It has been well documented that HCPs perform cervical cancer screening more frequently than is recommended despite current evidence-based guidance calling for longer screening intervals (Alber et al. 2018). Hills et al. (2015) developed an office-wide cervical cancer screening protocol and implementation process that identified an inaccurate cervical cancer screening database, excessive HCP time used to determine screening status, and tremendous variability in the interpretation and management of screening results by HCPs/clinic staff; as well as inconsistencies in patient follow-up and compliance with screening recommendations by patients and HCPs. As a result, all female patient charts were audited to identify those due for cervical cancer screening; a two-part clinical decision support system to streamline the process of identifying those due for cervical cancer screening was established; HCPs were educated on the revised national cervical cancer screening guidelines and adopted office protocol; patients were provided with cervical cancer screening reminder letters; and a procedure manual, including the clinical decision tool, was developed to maintain uniformity and ensure best practices into the future (Hills et al., 2015). These changes enabled HCPs to double the number of patients receiving appropriate screening, overuse of cervical cancer screening decreased from 9.8 to 2.9%, and the number of under-screened patients was cut in half, suggesting that targeting compliance barriers with the addition of patient-focused strategies is more likely to increase guideline compliance (Hills et al., 2015).

Haas et al. (2015), Roland et al. (2013), and Teoh et al. (2015) implemented the use of surveys to assess HCP attitudes/beliefs, screening practices, and adherence to cervical cancer screening guidelines. All found that HCPs do not consistently follow current screening recommendations due to a lack of HCP knowledge of the current recommendations, concerns related to patient loss to follow-up related to the

lengthened screening intervals, a perceived lack of support from clinic administration, and HCP disagreement with updated guidelines. Alber et al. (2018) conducted a systematic review of the overuse of cervical cancer screening and associated interventions to reduce overuse. They found HCPs report nonadherence to guidelines due to disagreement with updated recommendations, concerns regarding the risk of malpractice lawsuits, patient concerns, and limited time to discuss risks and benefits of lengthened screening with patients. The authors suggest that a wide-ranging intervention strategy focused on patients, HCPs, and systems may hold the greatest potential for improving adherence to updated guidelines (Alber et al., 2018). Through the use of mixed methods research synthesis, Tatar et al. (2018) found when HCPs lack knowledge about or are uncomfortable with recommendations, it can negatively impact patient preventive health behaviors. Efforts aimed at increasing HCP awareness of and comfort with the latest guidelines while employing strategies that increase a woman's knowledge of HPV and HPV testing may increase HPV test acceptability and subsequently increase adherence to the current recommendations (Tatar et al., 2018).

Cultural identity and socioeconomic status contribute to cervical cancer screening practices, cervical cancer incidence, and mortality. Silver and Kobrin (2020) found women most at risk of developing cervical cancer, and those who account for the majority of cervical cancer incidence and mortality are under-screened, unvaccinated against HPV, younger aged, and uninsured. Efforts focused on these groups through education, and resource allocation are likely to make the most significant impact on reducing cervical cancer incidence and mortality (Silver & Kobrin, 2020). Cultural identity has been identified as either a facilitator or a barrier to cervical cancer screening by Adams et al. (2020), Bellinger et al. (2015), and Moore de Peralta et al. (2015). Bellinger et al. (2015) found that among African American women in SC, knowledge of HPV and cervical cancer risk is low, stigma and fear negatively influenced screening rates, and screening barriers include no insurance, cost, access to care, and the "Strong Black Woman" script, where competing priorities outweigh the need for personal preventive screening. Study findings support the use of tailored and culturally relevant interventions to address low knowledge and risk perception; care settings conducive to shared

decision making to improve trust between high-risk patients and HCPs; strategies to identify rarely or never screened women; and culturally relevant messages about cervical cancer prevention with expanded access to quality cervical cancer prevention and control services (Bellinger et al., 2015).

Adams et al. (2020) found that cervical cancer-related health disparities in South Carolina are among the largest in the nation, citing poor access to health care as a barrier to seeking cervical cancer screening and residing in rural areas causing challenges in accessing care due to long travel distances to health care facilities. Participation in the Centers for Disease Control and Prevention (CDC) funded breast and cervical screening program in SC, BCN, where certain breast and cervical cancer screening services are provided for free, may have a positive impact on cervical cancer screening rates among this population (Adams et al., 2020). Additionally, Moore de Peralta et al. (2015) and Sundstrom et al. (2018) utilized the Health Belief Model (HBM) as a framework to conceptualize the direction and implementation of their studies. These studies demonstrated the effectiveness of the HBM to address cervical cancer screening prevention, to understand cervical cancer screening behaviors among Hispanic and college-aged women, and to design culturally appropriate cervical cancer screening interventions based on perceived threats, perceived self-efficacy, and cues to action (Moore de Peralta et al., 2015; Sundstrom et al., 2018).

Landmark studies by Katki et al. (2011 & 2013) provide the basis upon which the addition of hrHPV screening became the foundation of cervical cancer screening, as hrHPV testing predicts future disease better than cytology alone despite any abnormalities found through cytology. This development influenced the most updated cervical cancer screening guidelines, lengthened screening intervals, can decrease health care costs and expenditures, and reduce patient anxiety regarding the potential for unnecessary cervical procedures and untoward pregnancy-related adversities. However, HCP perceptions, attitudes, and beliefs significantly influence adherence to cervical cancer screening guidelines. The evidence has shown that including HCP and patient education increases acceptance of hrHPV testing and lengthened screening intervals. Implementation of an evidence-based HCP education program on the updated cervical cancer screening guidelines to include

the rationale for the use of hrHPV testing and longer screening intervals will enable HCPs to have more confidence in the updated guidelines and in their ability to educate and reassure patients of the upcoming changes in screening, screening interval and their overall risk of cervical cancer. Providing this education will bring HCPs up to date with current screening recommendations and provide them with much-needed knowledge to influence and improve their beliefs and attitudes surrounding cervical cancer screening guidelines.

Evidence-based Practice: Verification of Chosen Option

HCP guideline adoption directly affects how cervical cancer screening is appropriately performed (Hills et al., 2015). Based on the literature review, an evidence-based educational intervention for the HCPs who perform cervical cancer screening and manage female patients was implemented at NCFMC. The educational intervention provided the 2018 USPSTF cervical cancer screening guidelines and the tools to perform a chart review to evaluate whether female patients are up to date on cervical cancer screening. An online survey/questionnaire assessed the attitudes and beliefs regarding the 2018 USPSTF cervical cancer screening guidelines before the educational intervention and two months postimplementation. The PICOT question that guided this intervention was: Does a supportive educational intervention among women's health and primary care HCPs at a Federally Qualified Health Center improve attitudes and beliefs about the most up-to-date cervical cancer screening guidelines after two months compared to preintervention?

Theoretical Framework or Evidence-based Practice Model

HCP acceptance and adherence to clinical guideline recommendations directly impacts how patients are screened for cervical cancer. The application of a theoretical model guided the design and implementation of this quality improvement project. Pathman et al. (1996) developed a four-step model to utilize as a template for adopting clinical practice guideline recommendations, postulating that HCPs make sequential, cognitive, and behavioral decisions as they comply with national clinical practice guidelines (see Appendix A). The underlying conceptual framework suggested that to adopt updated or new guidelines, HCPs must be

aware of them (awareness), agree with them (agreement), decide to follow them for some patients (adoption), and choose to follow them at appropriate times for all patients (adherence) (Doherty et al., 2018; Fleming et al., 2020; Hills et al., 2015; Mickan et al., 2011; Pathman et al., 1996). Failure to progress along this path will result in HCP non-compliance with the suggested guideline.

Development and administration of a baseline or pre-intervention survey assessed HCP demographics, screening guidelines, screening practices (interval and testing questions), and beliefs or attitudes about extending screening intervals to identify HCP awareness and agreement with the updated cervical cancer screening guidelines and intervals. The development of an evidence-based educational intervention attempted to fulfill any knowledge gaps about screening tests and intervals, and provided updated evidence supporting the guideline change, facilitating HCP agreement with the updated recommendation. Evaluating current practices and assessing future practice intentions through the administration of the survey and education on the proposed clinical cervical cancer screening protocol will facilitate the adoption of the 2018 USPSTF cervical cancer screening guideline. Although this quality improvement (QI) project did not focus on adherence to the updated guidelines, the post-intervention survey assessed whether HCPs are likely to adhere to the guidelines due to information provided in the educational intervention. This model's utilization evaluated how effective the educational intervention was on the HCP's decisions to adopt and potentially adhere to the 2018 USPSTF cervical cancer screening guidelines.

Goals, Objectives, and Expected Outcomes

The goals of this QI project were to:

1. Assess HCP's cervical cancer screening knowledge, attitudes, practices, and beliefs concerning cervical cancer screening tests and screening intervals;
2. Identify benefits and burdens to acceptance and suggested use of cervical cancer screening tests and screening intervals; and
3. Implement and evaluate a systematic, guideline-based quality improvement program for cervical

cancer screening.

The objectives met in this QI project were:

1. Review the proposed clinic protocol for cervical cancer screening according to the 2018 USPSTF cervical cancer screening guidelines by a multidisciplinary team comprised of the Primary Investigator (PI), the Chief Medical Officer (CMO), and a registered nurse;
2. The PI provided one (1) voice-over PowerPoint educational session to survey participants with visual presentation of the 2018 USPSTF cervical cancer screening guideline for clinical decision making on the appropriateness of cervical cancer screening presented in an algorithm form (see Appendix B); and the proposed NCFMC cervical cancer screening protocol (see Appendix C).

This QI project's expected outcomes were improving HCP attitudes and beliefs regarding updated cervical cancer screening recommendations, adopting a clinic-wide cervical cancer screening protocol, and increasing HCP confidence in their ability to identify eligible women to be screened according to the updated cervical cancer screening guidelines.

Methods (Plan)

The QI approach was to identify HCP attitudes, beliefs, and knowledge of the most updated cervical cancer screening guidelines and provide them with an evidence-based educational intervention to increase their confidence in the updated guidelines, improve their attitudes and beliefs, and screen patients more appropriately. The pre- and post-intervention survey were administered to participants to gather HCP demographic characteristics, screening practices, and HCP beliefs and attitudes regarding cervical cancer screening guidelines. The educational intervention included the proposal of an organization-wide cervical cancer screening protocol for future use and to aid in the improvement in HCP attitudes and beliefs surrounding extended screening intervals.

Project Design

The QI project design included implementing an educational intervention intended for the HCPs.

Educational sessions covered the epidemiology and natural history of cervical cancer and hrHPV, an overview of the 2018 USPSTF cervical cancer screening guidelines and the organizations who support the updated recommendations, billing and coding information for the reimbursement of screening, an overview of the 2019 ASCCP management guidelines, and an introduction of the clinical cervical cancer screening protocol. Quantitative and qualitative measures using a pre- and post-intervention survey were evaluated to assess attitudes and beliefs regarding the knowledge of hrHPV and cervical cancer screening, updated screening recommendations and screening intervals, current screening practices, and HCPs' intent to adhere to recommended guidelines after the educational intervention.

Project Site and Population

NCFMC was chartered in 1989 as a non-profit 501(c) 3 organization and received federal funding as a community health center in September 1991 (NCFMC, 2020). NCFMC provides comprehensive primary care to over 10,000 SC residents, serving York, Chester, and Lancaster Counties, regardless of their ability to pay. The mission to "improve the health of the communities…by providing quality comprehensive healthcare that is accessible and affordable through collaborative efforts" (NCFMC, 2020), is supported by using a sliding fee scale that is updated annually by the Bureau of Primary Health Care. NCFMC provides quality, compassionate care to this vulnerable population, where 93% are low-income (below 200% of the Federal Poverty Level) and 66% identify as an ethnic or racial minority. Services offered at three locations include adult medicine, pediatric care, women's health, behavioral health, nutrition services, and onsite radiology, laboratory, and pharmacy services. NCFMC is identified as a Patient Centered Medical Home (PCMH) and is a BCN HCP (NCFMC, 2020).

The organizational makeup of the clinic includes the CEO as the top administrator (D. Bennett, personal communication, July 23, 2020). The administrative staff includes the Chief Operating Officer (COO), Chief Financial Officer (CFO), the CMOs, the Director of Nursing (DON), the Director of Quality (DOQ), and the Director of Information Technology (DIT). Clinical staff includes the HCPs (physicians,

nurse practitioners, social workers), pharmacists, clinical support staff (registered nurses, licensed practical nurses, and medical assistants), clinical administrative staff, and lab/pharmacy technicians. Customer support staff includes the front desk staff, the call center staff, and the site managers (D. Bennett, personal communication, July 23, 2020).

For this project's purposes, the PI had the most interaction with the HCPs through e-mail and online correspondence (PowerPoint and data collection). The clinical support staff has decreased in the aftermath of the current COVID pandemic. This causes issues with clinical tasks being completed but was not a barrier or constraint to the implementation of the project. A new co-CMO, who is a supporter of standardization, quality, and clinical practice guidelines, will facilitate the adoption of the proposed clinical protocol for cervical cancer screening going forward, and contribute to the improvement of HCP attitudes and beliefs.

NCFMC employs 12 primary care/women's health HCPs, two pediatric HCPs, five behavioral health HCPs, and a support staff that includes nurses, medical assistants, clinical administrators, lab, and pharmacy staff (D. Bennett, personal communication, July 23, 2020). The main stakeholders include the patients, the staff, the Chief Executive Officer (CEO) and administrative staff, and the Board of Directors. This project included the participation of the HCPs. Participants were eligible if they had the credential to perform cervical cancer screening or participated in cervical cancer screening in any way, and those who did not were excluded. The goal was for all eligible HCPs to participate (10 total HCPs, not including the project PI and a co-CMO) to obtain a representative clinic sample of the attitude and beliefs regarding the updated cervical cancer screening guidelines. The organization can make a significant impact on the prevention of cervical cancer in the local area if all eligible female patients are adequately screened. A letter of support for this project was included in the appendices (see Appendix D).

Measurement Instruments

To measure this project's outcomes, an adaptation of the following instrument was used: baseline Cx3 (CDC Cervical Cancer Study) Study HCP survey. Permission to utilize the survey was requested and obtained

through RightsLink (see Appendix E). Pre-intervention measures included participant demographics, cervical cancer screening practices, perceived support for cotesting and extending the screening intervals, beliefs about cotesting and extending screening intervals, factors considered when deciding to extend the screening interval, and perceived risks and benefits to extending the screening interval (see Appendix F). Post-intervention measures included cervical cancer screening practices, perceived support for cotesting and extending the screening intervals, beliefs about cotesting and extending the screening intervals, factors considered when deciding to extend the screening interval, perceived risks and benefits to extending the screening interval, and the likelihood of adherence to the updated screening guidelines and recommended screening intervals (see Appendix G). This survey tool was developed to address HCP's cervical cancer screening knowledge, attitudes, practices, and beliefs regarding hrHPV testing with cytology and screening intervals to identify benefits and burdens to acceptance and suggested use of screening (Benard et al., 2014; Lin et al., 2015; Roland et al., 2013; Roland et al., 2015). Measures included were based upon national primary care HCP cervical cancer screening practice surveys. Survey validity and reliability were not calculated, but an estimate of participant burden, suitability and relevance of the survey questions, and comments about the format were obtained through pilot testing of the baseline survey with seven primary care HCPs in the Atlanta area (Benard et al., 2014; Lin et al., 2015; Roland et al., 2013; Teoh et al., 2015).

Data Collection Procedures

All HCPs who were credentialed to collect Pap tests were invited to participate in the QI project surveys and educational intervention. The surveys were self-administered via an e-mail link and the PI followed-up weekly with non-responders. Data was collected and stored in an Excel spreadsheet on a secure UA Box file for analysis.

Pre-Intervention Phase

Participants were notified of the project and the inclusion requirements via e-mail. Informed consent was obtained from each participant by the PI in written form, then scanned, and finally stored electronically

on UA Box. Each participant was offered a copy of the signed consent form and all declined. Once a copy of the signed form was scanned electronically, the hard copy was destroyed. A link to access the pre-implementation survey was e-mailed to participants for completion after obtaining written informed consent. Each participant was assigned a number upon survey completion to deidentify the data, and a key to the numbers and participants was kept in a secure UA box file.

Intervention

A voice-over PowerPoint presentation that focused on providing a visual presentation of the updated cervical cancer screening guidelines, the clinical decision-making tool (see Appendix B), and the proposed clinical cervical cancer screening protocol (Appendix C) was provided via e-mail after completion of the pre-intervention survey. Each participant was provided with access to the educational presentation, the clinical decision-making tool, a cervical cancer screening guidelines summary sheet, a billing and coding reference, and recommended reading supporting the use of the current guidelines and recommended cervical cancer screening tests.

Post-Intervention Phase

Two months after the implementation of the educational intervention, the post-implementation survey was administered, and the results were analyzed to determine if the project outcomes were met. Once the objectives were met, recommended permanent changes were discussed with the clinic administrative team, CMOs, DON and the Quality Director. The completed results, outcomes, and expected changes to the organization were disseminated through a visual presentation to the greater clinic and other interested entities.

Data Analysis

The independent (educational intervention) and dependent (improvement in attitudes and beliefs) variables were nominal measurement levels. Most of the survey answers were considered to be ordinal measurement levels. The results were described in narrative form, but also utilized bar graphs, charts, and tables to describe the data. Descriptive statistics explained the demographic data collected through the

surveys. The surveys were scored allowing for a paired T test, but the results were determined not to be statistically significant likely due to the small sample size.

Cost-Benefit Analysis/Budget

The most significant projected nonmonetary cost associated with this project was the time spent to complete the pre- and post-intervention surveys and for participants to receive the educational intervention. It has not yet been determined if there was an initial increase in the time it takes for HCPs to appropriately document cervical cancer screening according to the educational intervention recommendations. These costs will offset the practice by enabling HCPs to adequately screen eligible women, increase the overall cervical cancer screening rate, allow provision of care based on best practices, and improve clinic eligibility for additional governmental funding to continue to provide care to this vulnerable population.

The ASCCP management guidelines are no longer available in algorithm form. Participants were provided a link to access the recommendations and were also provided the information to download the mobile ASCCP application for their personal use. As a part of the employee benefits package, NCFMC provides money to utilize for continuing education for employees. The women's health HCPs currently manage abnormal cervical cancer screening as per the projected clinical protocol. At the time of this project, it was suggested that the price of the mobile application be included in the benefits package for the HCPs who will utilize it the most clinically. The decision to adopt this practice has not yet been made available, however, the HCPs were provided access to the information online for free through the provided link.

Bains et al (2019) estimated that incorporating hrHPV testing is likely to decrease the number of cytology tests, cervical cancer incidence, and health systems costs by a projected $15 million. Moving from cytology alone to primary hrHPV testing or cotesting with a five-year screening interval, would increase health care savings to $39 million due to a decrease in costs associated with testing per woman by $44 (Bains et al., 2019). Meeting the expected outcomes of this project provide the patients with the most significant benefit: identifying eligibility, decreasing associated health care costs, and being appropriately screened

according to their age based on national practice guidelines.

Timeline

Institutional Review Board (IRB) approval was received January 2021. January 2021 was utilized to recruit participants and complete the pre-intervention survey. The educational intervention was provided starting January 31, 2021. Participants were provided with the use of the clinical decision-making tool at the time of the educational intervention. Implementation continued through April 2021. The post-implementation survey was provided to participants starting in April 2021, after the two-month implementation period, and the results, dissemination, and manuscript were evaluated, analyzed, and completed throughout May and June 2021 (see Appendix H).

Ethical Considerations/Protection of Human Subjects

The University of Alabama (UA) IRB approval was obtained prior to initiating this project. The NCFMC IRB deferment determination can be found in the appendixes (see Appendix I). No personal health information was collected from the participants in this project. No patients were included as participants in this project. Survey responses were deidentified using assigned numbers and then stored on a key in the UA Box so that they could be matched to the post-intervention survey. All electronic data was stored securely on UA Box. There was no hard copy data that required storage in a locked filing cabinet in the practice office (only accessible to the PI).

Results

There were 10 eligible HCPs at NCFMC; seven agreed to participate, and six completed both the pre- and post-intervention surveys. All HCPs were between the ages of 35 and 50, most were nurse practitioners (66%), and over half of the HCPs specialized in family practice/adult medicine (66%) (Table 1). Half of the HCPs stated it would be “very easy” to follow the updated guidelines, and nearly all the HCPs stated they would likely adhere to the updated guidelines post-intervention (83%). Although too underpowered for statistical significance, this project was determined to be clinically significant as evidenced by an increase in

the post-implementation overall survey scores of two-thirds of the HCPs.

Cervical Cancer Screening Practices

In patients aged 30 years and older, 67% of HCPs reported **usually** or **always** cotesting patients for screening, and 83% reported **usually** or **always** using the hrHPV test for the management of an Atypical Squamous Cells of Undetermined Significance (ASC-US) Pap test on both the pre- and post-intervention surveys. Given the clinical scenario of a 35-year-old woman with a normal cotest result, the majority of HCPs would recommend her next screening in greater than three years (67%), which was the guideline-consistent recommendation at the time of the project, and the remainder of the HCPs recommend follow up screening in three years (33%). For the same 35-year-old woman with a positive hrHPV test and normal Pap test, half of the HCPs recommended follow up screening in one year, the guideline-consistent recommendation at the time of the project, and one-third recommended the next screen in three years. After the implementation of the educational intervention, 83% of HCPs reported they would recommend follow up screening in one year in a 35-year-old woman with a positive hrHPV test and normal Pap test (Fig. 1).

Perceived Support for Cotesting and Extending the Screening Interval

Prior to the educational intervention, half of the HCPs perceived professional specialty organizations, national health organizations, and professional journals to be more encouraging of cotesting in women aged 30 years and older than patients (33%) and the administration in their practice (17%). Additionally, 83% of HCPs perceived professional specialty organizations, national health organizations, and professional journals to be more encouraging of extending the screening interval to five years between normal cotests in women aged 30 years and older than patients (33%). Implementation of the educational intervention to include use of the proposed cervical cancer screening protocol and clinical decision-making tool increased HCPs perception of encouragement from professional specialty organizations, national health organizations, and professional journals to both cotest and extend the screening interval among women aged 30 years and older (83% and 67%, respectively). All the HCPs perceived that their administration neither encouraged nor discouraged the

use of cotesting for routine screening and extending the interval to five years between normal cotest results in women aged 30 and older post-intervention (Table 2).

HCP Beliefs About Cotesting and Extending the Screening Interval

Pre-intervention, most of the HCPs believed that cotesting women aged 30 years and older was **extremely** or **quite** good (67%), easy (67%), and beneficial (50%). No HCPs believed it was **extremely** or **quite** hard to cotest these women, but 17% believed cotesting to be bad and harmful. Similarly, many HCPs reported that extending the screening interval for women aged 30 and older with a normal cotest result would be **extremely** or **quite** good (67%), easy (67%), and beneficial (67%). Post-intervention, most HCPs (83%) believed cotesting and extending the screening interval in women aged 30 and older to at least three years was **extremely** or **quite** good, easy, and beneficial. There were no HCPs who believed cotesting or extending the screening interval was bad, hard, or harmful compared to baseline (Fig. 2).

Factors HCPs Considered When Deciding to Extend the Screening Interval

HCPs considered a history of abnormal Pap results, current hrHPV status, and patient age a "great deal" (83% for each) when determining to extend the screening interval at baseline and post-intervention. Additionally, 67% of HCPs considered current Pap test results a "great deal", and the number of lifetime sexual partners as moderately important at baseline. Half of the HCPs considered current sexual partners, history of or current cigarette smoking, history of regular Pap screening, and whether the patient will return for future screening as moderately important when considering screening interval length at baseline. All HCPs considered immune system status and current Pap test results a "great deal" compared to baseline (33% and 67%, respectively at baseline), and found a history of regular Pap screening to be more important post-intervention (83% of HCPs reported they considered this a "great deal" compared to 33% at baseline). Half of the HCPs reconsidered exposure to diethylstilbestrol (DES) a "great deal" in extending the screening interval compared to 17%, with 50% not considering it a factor at baseline (Fig. 3).

HCP Perceived Risks and Benefits to Extending the Screening Interval

Multiple HCPs' (four of six) post-intervention responses scored less than compared to baseline when evaluating perceived risks and benefits to extending the screening interval among women aged 30 years and older with a normal cotest result. Every HCP agreed it would not take too much time to explain the extended interval to patients (compared to 67% at baseline). Many HCPs reported an extended screening interval would increase patient concerns about missing cervical cancer (83%, up from 67% at baseline), cause the patient to lose contact with the medical system (67%, up from 50% at baseline), and result in the patient not returning annually for other screening tests (67%, unchanged from baseline). HCPs did not believe extending the screening interval would cause an increase in the rates of cervical precancer (50% compared to 83% at baseline), put the patient at an increased risk of cervical cancer (67% compared to 83% at baseline), or increase the risk of liability if the patient's next result were abnormal (67% compared to 83% at baseline). Despite these findings, most HCPs (67%) believed that the extended screening interval would not decrease the care provided to the patient and would ultimately decrease overall health care costs compared to 50% at baseline (Fig. 4).

Interpretation/Discussion

The current cervical cancer screening guidelines continue to allow the option for "cytology alone" when screening women aged 30 years and older, despite increasing evidence that has shown superior sensitivity of hrHPV to detect CIN compared to cytology in primary cervical cancer screening (Tatar et al., 2018). Most HCPs (83%) reported the use of cotesting among appropriate patients to be beneficial post-intervention compared to half of the HCPs at baseline. Despite this improvement, only two-thirds of the HCPs reported the routine use of cotesting to screen appropriate patients (unchanged from baseline), suggesting there are some HCPs who remain more comfortable utilizing cytology alone (screening every three years if normal) for routine screening. If HCPs are prone to overuse cervical cancer screening as indicated by survey responses, they are utilizing BCN (and the physician/sliding fee account) funds on screening that is not

recommended, which puts patients at risk of unnecessary interventions with negative implications. It is unclear whether this is the result of a perceived lack of administrative support (to extend the interval and utilize hrHPV testing), the need for more thorough HCP (staff and administrative) educational efforts, the persistent resistance to change despite national guidelines and education, or patient disagreement with the updated recommendation for screening tests and intervals. However, when using hrHPV for the management of abnormal results, and when questioned with specific clinical scenarios that included cytologic/hrHPV abnormalities, HCPs overwhelmingly agree that the use of hrHPV testing at specific intervals is a helpful tool in determining a patient's risk of cervical cancer.

Although most of the HCPs agreed with the guideline-consistent recommendation for screening tests and interval at the time of the project, they did not perceive the support needed from patients to screen with cotesting or at intervals greater than three years. HCPs reported support from national-level sources (national health organizations, professional specialty organizations, and professional journals), but also reported that their administration neither encouraged nor discouraged both the use of cotesting and extending screening intervals, which signals a potential need for connecting clinic/patient-focused protocols with systems-level interventions. Further, this disconnect identifies the need for patient education from both the HCPs and clinic staff as the perceived lack of patient support may actually reflect HCP bias and discomfort. This education will be most effective if conducted by HCPs who are comfortable with the updated guidelines and can properly educate and support patients. Screening at appropriate intervals enables HCPs to utilize funds (BCN and sliding fee) appropriately, reduce patient risk of unnecessary interventions with negative sequelae, and to ultimately promote patient and administrative support for the use of proper testing and screening intervals.

While most HCPs were confident in their ability to explain the extended screening interval and did not believe the interval would decrease the care provided to the patient, most of them were concerned that patients would have increased worries about missing cervical cancer, would lose contact with the medical system, and would not return for other routine annual screening tests. When considering extension of the

screening guideline, factors related to medical and sexual history remained important to HCPs. With most national organizations supporting the transition to primary hrHPV testing as routine cervical cancer screening and the use of hrHPV in the management of abnormal cytology, HCPs should not need to rely so heavily upon factors such as educational level, race/ethnicity, and birth control method in their decision to extend the screening interval going forward. HCPs recorded increased scores post-implementation when considering immune status, current Pap test results, history of abnormal Pap test results, history of regular Pap screening, and patient age as important factors when deciding to extend the screening interval, which is consistent with the updated ASCCP risk-based management guidelines.

The most notable limitations of the project were the small sample size, clinic COVID-19 procedures, HCP schedules, and the format of the educational intervention. Initially, there were seven HCPs that agreed to participate. One HCP completed the baseline survey and the educational intervention, but was unable to complete the post-intervention survey prior to data analysis (those results were excluded from data analysis). Two of the six HCPs specialized in Women's Health. Although the project did not specifically assess whether HCPs were aware of or followed their specialty organizations' cervical cancer screening recommendations, it remains unclear whether their specialty knowledge may have impacted their responses. The COVID-19 procedures and HCP schedules prohibited in-person gatherings to discuss the project and provide the educational intervention. Because time was not allotted during the monthly (Zoom) HCP meeting as originally planned, HCPs were given instruction to watch a voice-over PowerPoint presentation after signing the consent form and completing the baseline survey, making it difficult to verify that the presentation was viewed in its entirety as intended.

Areas for future study include chart audits with feedback to HCPs about appropriate screening tests and screening intervals, educational sessions with HCPs, administration, and support/clinical staff (according to current COVID-19 policies), electronic health record (EHR) programming, and patient education. The project objectives did not include adherence to the current screening guidelines. Study in that area can

identify HCP specific barriers, if any, to ultimately improve adherence. One-on-one educational sessions, whether in person or virtual, are effective in addressing HCP behaviors, however interventions that focus on behavior change through a multi-system, clinic-wide approach will likely enhance cervical cancer prevention (Alber et al., 2018; Hills et al., 2015; Roland et al., 2013). Including administrators, the DOQ, and the DIT will have a tremendous impact on adherence of the clinic protocol. Evaluating methods to incorporate the most updated cervical cancer screening guidelines into the EHR with global alerts and reminder systems has the potential to identify patients who are eligible and/or due for screening. Educating patients on the change in practice by explaining the new guidelines and testing modalities, as well as the components of an annual exam will empower them to take ownership of their health and remain compliant with recommended preventative screening.

The findings of this project are mostly descriptive in nature due to the small sample size available at the time of project initiation. Additionally, the COVID-19 pandemic hindered the ability to conduct in-person educational sessions, meetings, and break-out sessions. Despite these challenges, there was evidence of improvement in HCP beliefs, attitudes, and practices, as two-thirds of the HCPs' survey scores improved post-implementation, supporting the clinical significance of this project. HCPs were able to appropriately identify the guideline-consistent recommendation for the next screening in a woman with a normal Pap test and positive hrHPV, believed screening women aged 30 and older with a cotest at least three years apart was good, easy, and beneficial, and considered DES exposure a "great deal" after receiving an evidence-based educational intervention.

Conclusion

Cervical cancer is one of the most common yet preventable gynecologic cancers plaguing women in the US (Tatar et al., 2018). Uninsured and low-income women suffer disproportionately regarding cervical cancer incidence and mortality, likely due to their inability to access healthcare services. Providing an evidence-based educational intervention outlining the most recent guideline change and the advances in

detection with the addition of hrHPV testing combined with a decision-making tool for identification of those eligible for screening, improved HCP beliefs and attitudes regarding the updated guidelines and enabled HCPs to implement these changes in their practice (Benard et al., 2015, Doherty et al., 2018; Haas et al., 2015; Hills et al., 2015; Lin et al., 2015; Roland et al., 2015; Teoh et al., 2015). Although adherence is not mandated, providing information regarding the updated changes, and improving attitudes and beliefs will improve cervical cancer screening practices and enable NCFMC to reach the HP2030 cervical cancer screening goal.

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Table 1

		NUMBER OF PROVIDERS
AGE	<35	0
	35-50	6
	>50	0
GENDER	Male	1
	Female	5
RACE/ETHNICITY	Hispanic or Latino	0
	American Indian/Alaska Native	0
	Asian	1
	Black/African American	2
	Native Hawaiian/Pacific Islander	0
	White/Caucasian	3
	Other	0
DEGREE	MD/DO	2
	NP	4
	PA	0
	Other	0
YEARS IN PRACTICE	< 5 years	1
	5 – 10 years	4
	>10 years	1
SPECIALTY	Family Practice/Adult Medicine	4
	Internal Medicine	0
	OB/GYN/Women's Health	2
	Other	0

Personal characteristics of HCPs who completed both the baseline and post-intervention survey (n=6).

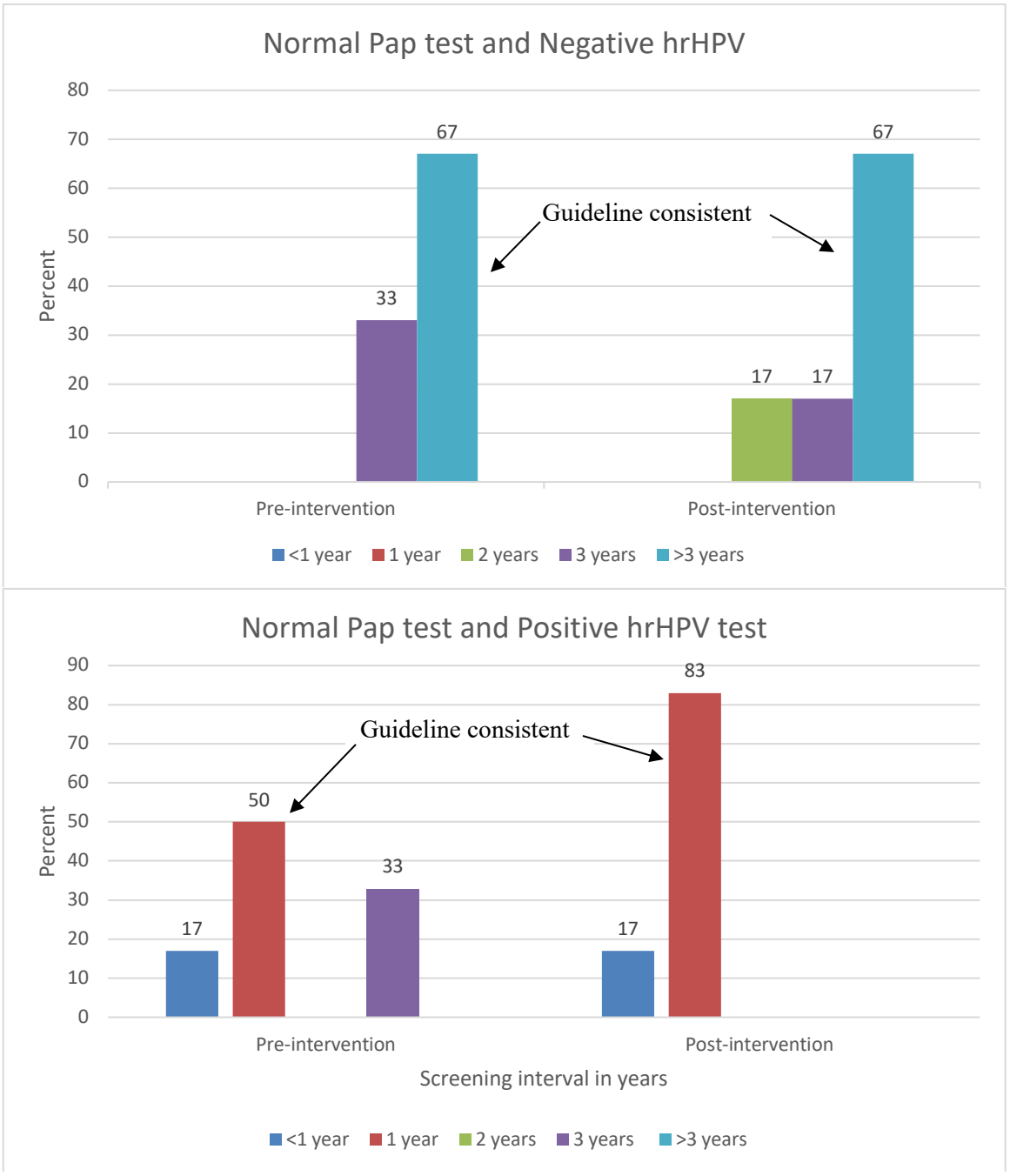
Table 2

	Use of cotest for routine screening[a, b]						Extending screening interval with normal cotest result[a, b, c]					
	Discourage		**Neither**		**Encourage**		**Discourage**		**Neither**		**Encourage**	
Patients			**67%**	**83%**	**33%**	**17%**	**33%**	**17%**	**67%**	**83%**		
Colleagues			**50%**	**33%**	**50%**	**67%**			**50%**	**50%**	**50%**	**50%**
Administration in their practice			**83%**	**100%**	**17%**				**83%**	**100%**	**17%**	
Professional Specialty Organizations	**33%**		**17%**	**17%**	**50%**	**83%**			**17%**	**33%**	**83%**	**67%**
National Health Organizations	**33%**		**17%**	**17%**	**50%**	**83%**			**17%**	**33%**	**83%**	**67%**
Professional Journals	**33%**		**17%**	**17%**	**50%**	**83%**			**17%**	**33%**	**83%**	**67%**

[a]Pre-intervention data is listed first, then post-intervention data.
[b]For women aged 30 years and older.
[c]Five-year screening interval.

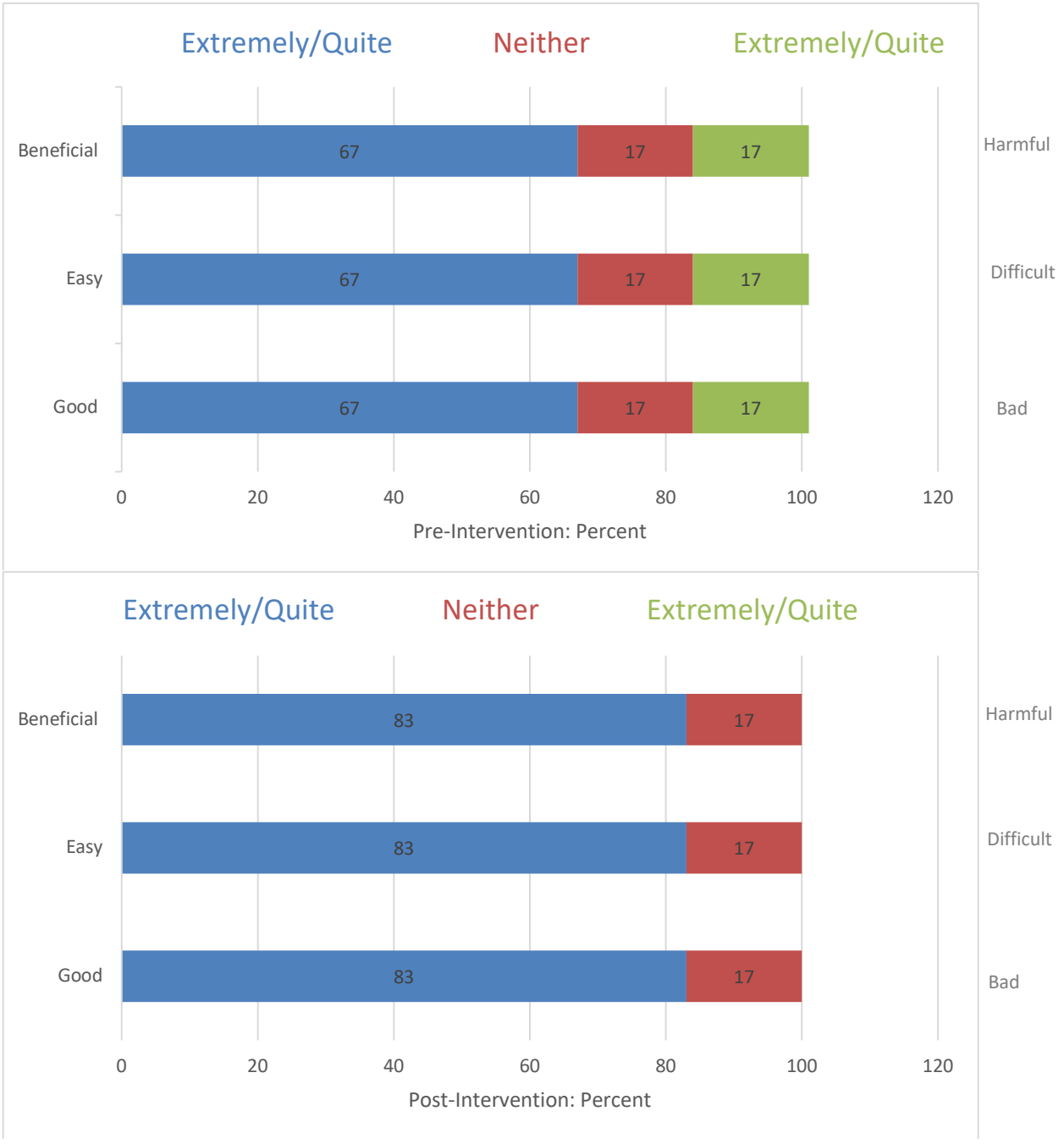
Perceived support by HCPs who completed the pre- and post-intervention survey for the use of the cotest and extending the screening interval among women aged 30 years and older, 2021.

Figure 1



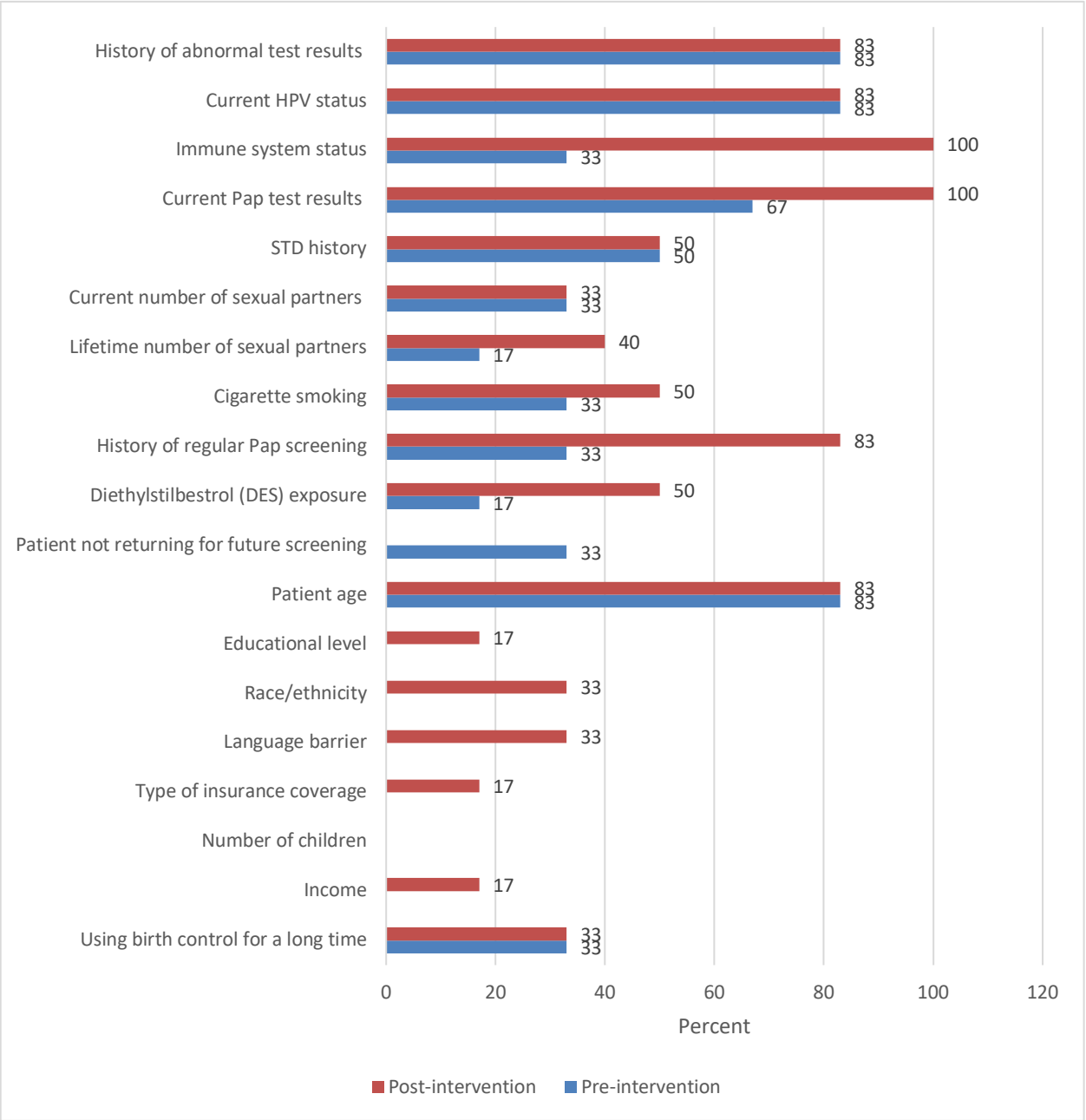
Pre- and post-intervention HCP recommended screening intervals based on the cotest result for a woman 35 years of age (n=6).

Figure 2



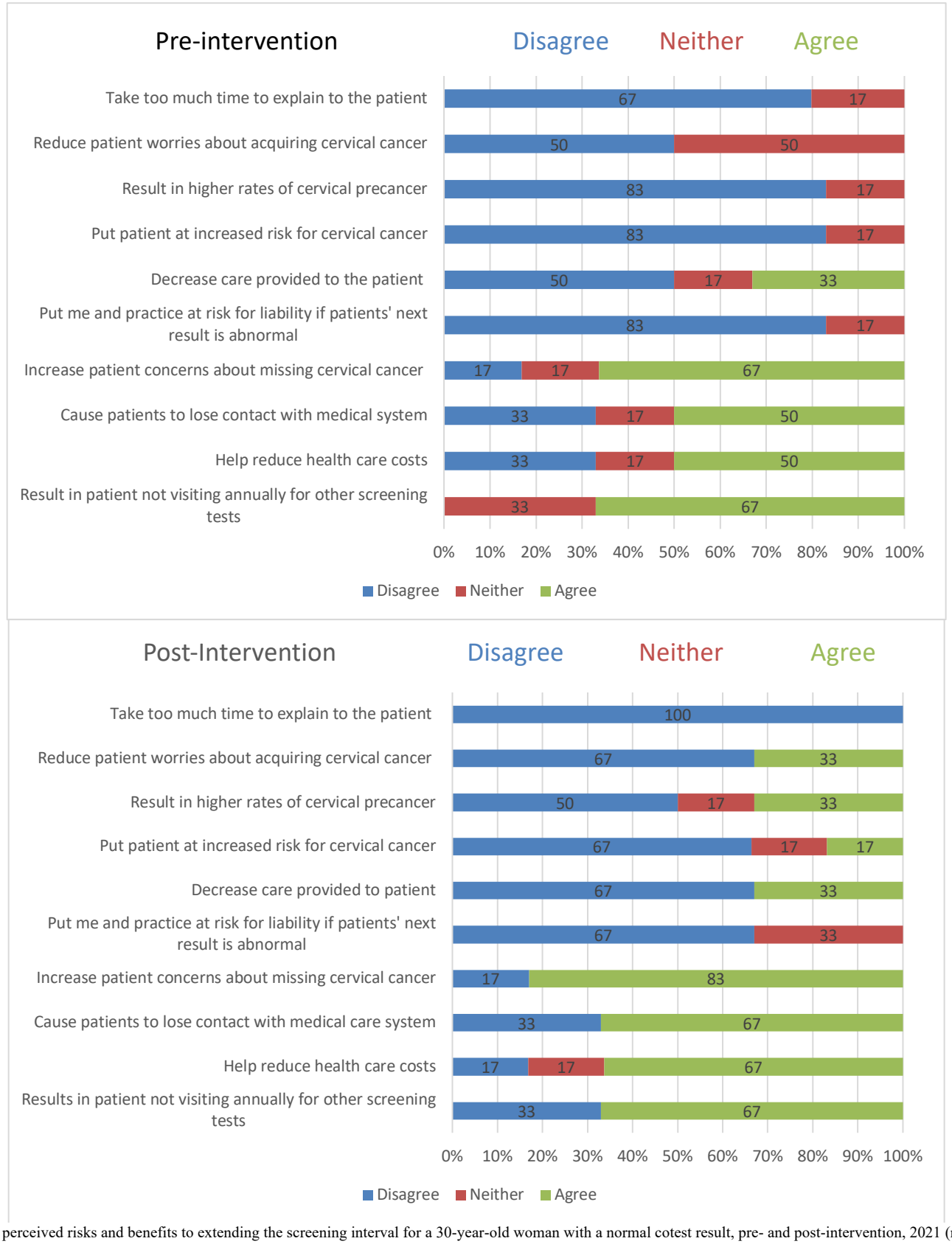
HCP beliefs about extending the screening interval to 3 or more years for a woman aged 30 and older with a normal cotest result, 2021 (n=6). Survey questions: Deciding to extend the cervical cancer screening interval to 3 or more years because a woman aged 30 and older had received a normal Pap result and a negative HPV test would be… 1) good versus bad; 2) easy versus difficult; and 3) beneficial versus harmful.

Figure 3



Pre- and post-intervention factors considered important ("a great deal") to HCPs when deciding to extend the screening interval for a woman aged 30 years and older[1] (n=6), 2021. [1]No distinction made as to whether the Pap test for the cotest would be used to screen.

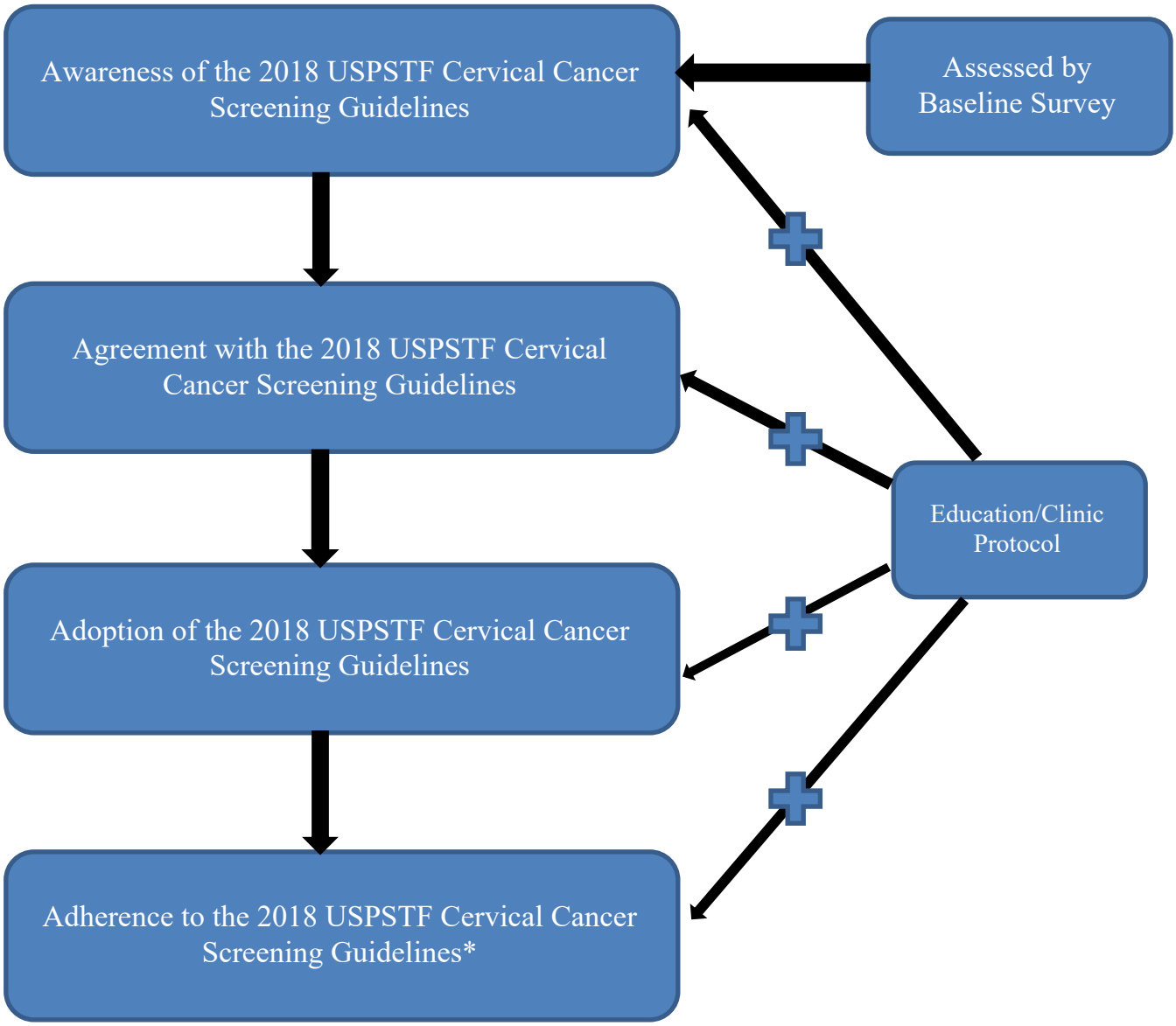
Figure 4



HCP perceived risks and benefits to extending the screening interval for a 30-year-old woman with a normal cotest result, pre- and post-intervention, 2021 (n=6).

Appendix A

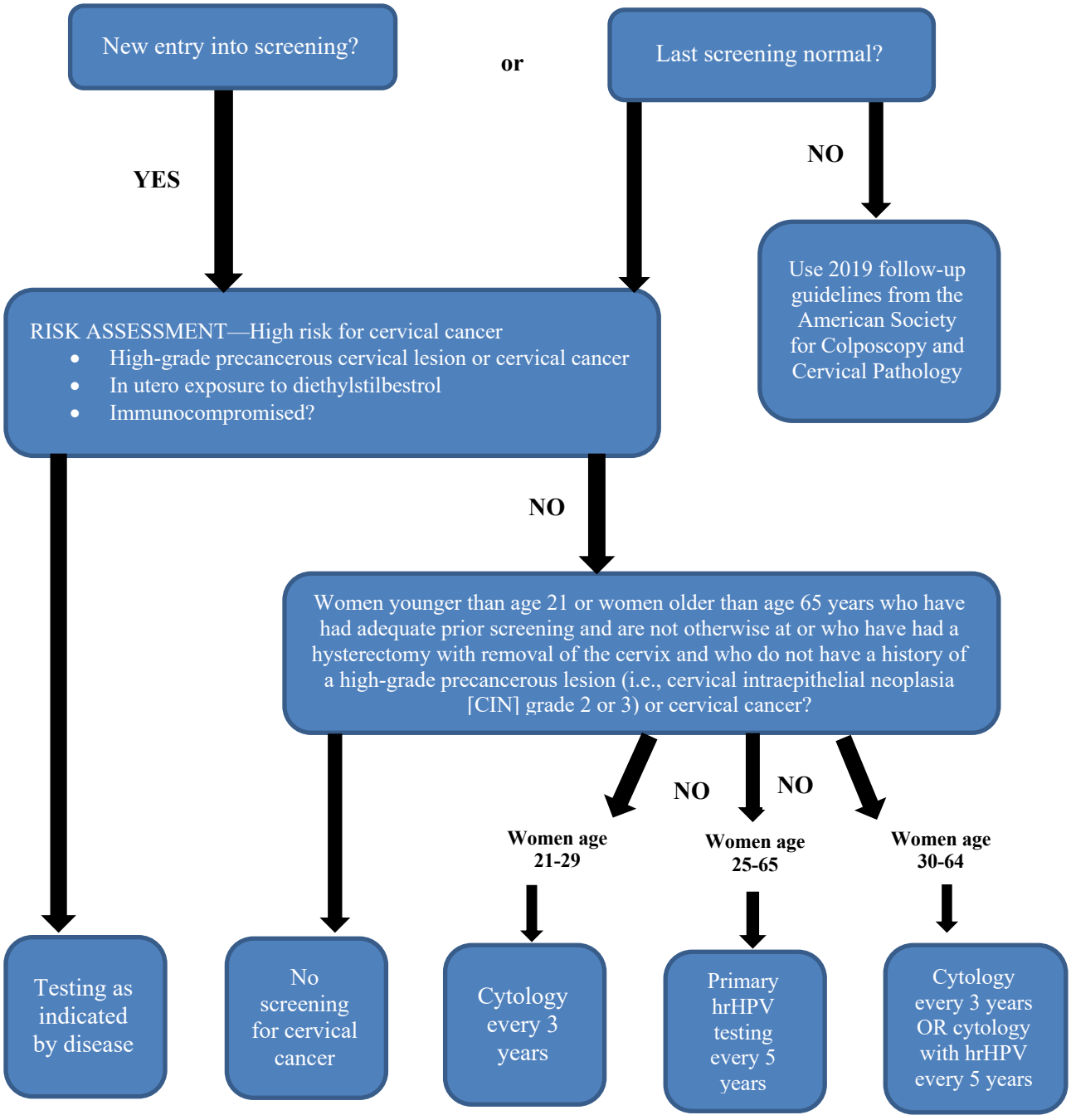
Theoretical Conceptual Framework



Adapted from "Examination of physicians' adherence to the 2013 ACC/AHA statin/cholesterol guidelines using a framework of awareness to adherence: A cross-sectional study," by M. L. Fleming, S. Rege, M. L. Johnson, O. Serna, T. Esse, J. Choi, & S. M. Abughosh, 2020, *JRSM Cardiovascular Disease, 9*, p. 3 (DOI 10.1177/2048004020947298). CC BY-NC

Appendix B

2018 USPSTF/ACOG Cervical Cancer Screening Clinical Practice Guidelines/Clinical Decision-Making Tool



Adapted from "Evaluating a quality improvement program for cervical cancer screening at an urban safety net clinic," by Hills, R. L., Kulbok, P. A., & Clark, M., 2015, *Health Promotion Practice, 16*(5), 631-641 and "Screening for Cervical Cancer: US Preventitive Services Task Force Recommendation statement," by the US Preventive Services Task Force, Curry, S. J., Krist, A. H., Owens, D. K., Barry, M. J., Caughey, A. B., Davidson, K. W., Doubeni, C. A., Epling, J. W., Jr, Kemper, A. R., Kubik, M., Landefeld, C. S., Mangione, C. M., Phipps, M. G., Silverstein, M., Simon, M. A., Tseng, C. W., & Wong, J. B., 2018, *JAMA, 320*(7), 674–686. https://doi.org/10.1001/jama.2018.10897

Appendix C

NCFMC Cervical Cancer Screening Protocol

This clinical protocol is based upon screening guidelines agreed upon by the US Preventive Services Task Force (USPSTF), the American Cancer Society (ACS), the American College of Obstetricians and Gynecologists (ACOG), and the American Society for Clinical Pathology (ASCP). This protocol endorses the use of the American Society for Colposcopy and Cervical Pathology's (ASCCP) 2019 Risk-Based Management Consensus Guidelines for Abnormal Cervical Cancer Screening Test and Cancer Precursors, found at http://www.asccp.org/.

Screening Tests

Testing for cervical cancer is performed using Liquid-Based Cytology (ThinPrep). Consideration should be given to the use of high-risk human papillomavirus (hrHPV) testing in conjunction with cervical cytology (cotest) for screening women 30 years of age and older.

Age to Initiate Screening

Cervical cancer screening should begin at 21 years of age. Women aged younger than 21 should not be screened regardless of the age of sexual initiation or other risk factors.

General Information

- The need for cervical cancer screening should not be the only basis for the onset of gynecological care.
- For the purposes of this protocol, an ADOLESCENT is defined as a female 20 years of age or younger.
- Adolescents must be able to obtain appropriate preventive health care, including, but not limited to, an assessment of health risks, counseling for pregnancy and sexually transmitted infection (STI) prevention, provision of contraceptive methods, and treatment of STIs; even if they do not need cervical cancer screening.
- Clinical breast exams and yearly speculum/bimanual pelvic exams should be discussed and provided (if clinically warranted) even if no cervical cancer screening is performed.
- Adolescents and young women who have received the HPV vaccine should continue cervical cancer screening according to the current guidelines.
- In the absence of endocervical cells/transformation zone, if a Pap smear is satisfactory and negative, then regular screening should be continued.
- Cotesting should NOT be performed in women younger than 30 years

AGE TO BEGIN	SCREENING EXAM	SCREENING INTERVAL
AGE 21-29	Cytology (ThinPrep)	Cytology only every 3 years
AGE 30-65	Primary hrHPV testing	Every 5 years
AGE 30-65	Cytology (ThinPrep) and hrHPV testing ("cotest") PREFERRED method	Every 5 years
AGE 30-65	Cytology (ThinPrep) ACCEPTABLE method	Cytology only every 3 years

Frequency of Screening

hrHPV as an adjunct to cervical cytology testing is the preferred method of testing for cervical cancer screening in women 30 years of age or older. If both tests are negative, testing occurs every five years. For abnormal results, follow-up guidelines may be found on http://www.asccp.org/.

Special Considerations

- Women with any of the following risk factors may require more frequent cervical cancer screening than recommended in the routine screening guidelines, which were intended for average-risk women:
    - Women who are infected with HIV

    - Women who are immunocompromised (such as those who have received solid organ transplants)
    - Women who were exposed to diethylstibestrol (DES) in utero
    - Women previously treated for CIN 2, CIN 3, or cancer
        - Screening should continue for a total of 20 years after spontaneous regression or appropriate management of CIN 2, CIN 3 or cancer, even if it extends screening past 65 years
- Women whose cytology exam is unsatisfactory need a repeat cytology exam within the next 2 to 4 months
- Per the ASCCP guidelines (follow-up of abnormal cervical cancer screening—Pap test), adolescents and pregnant women are also given special consideration. See guidelines for details at http://www.asccp.org/.

For Women Who Have Had a Hysterectomy

- For women who still have a cervix, continue testing as indicated by age and Pap history
- Total hysterectomy for benign gynecological disease (no cervix present)—screening with vaginal cytology is NOT indicated; this does not preclude a pelvic exam, if clinically warranted
- Hysterectomy for INVASIVE cancer—continue screening as recommended by Gynecologic Oncology

Upper Age Limit for Screening

- Women aged older than 65 years with evidence of adequate negative prior screening and no history of CIN 2+
    - Adequate negative prior screening tests results are defined as three consecutive negative cytology results or two consecutive negative cotest results within the previous 10 years, with the most recent test performed within the past 5 years
- Women with history of CIN 2 or higher should continue screening for a total of 20 years after spontaneous regression or appropriate management, even if it extends screening past 65 years
- If no adequate history can be documented, screening is warranted
- Once screening is discontinued, it should not be started again for any resion, even if a woman reports having a new sexual partner

Follow-up of Abnormal Cytology Results/Indications for Colposcopy

- Women who have had two "unsatisfactory for evaluation" tests 2-4 months apart
- Women who have an abnormal Pap test that requires evaluation via colposcopy as recommended by the 2019 ASCCP Risk-Based Management Consensus Guidelines found at http://www.asccp.org/.
- **Women with any gynecologic cancer should be referred to a Gynecologic Oncologist**

Patient Education

Clinicians should educate all women about the components of the pelvic exam, including whether cervical cancer screening is performed and whether or not the woman is being tested for STIs, including HPV. Given the recommended increase in screening interval, consideration should be given to providing women with copies of their Pap test/HPV results.

Documentation

- Z12.4—Encounter for screening for malignant neoplasm of cervix
- Z11.51—Encounter for screening for human papillomavirus (HPV)
- Z11.3—Encounter for STD screening (if ordering a test that includes STI testing)
- Test codes
    - 21-29 year olds
        - 194074: Pap IG, rfx HPV ASCU (cytology alone every 3 years)
        - 196527: Pap IG, Ct-Ng TV rfx HPV ASCU (cytology alone every 3 years with STI)
    - 30-65 year olds
        - 199305: IGP, Invader HPV, 16/18 (cotest every 5 years)
        - 196220: IGP, CtNgTv, CobasHPV 16/18 (cotest every 5 years with STI)
        - 194074: Pap IG, rfx HPV ASCU (for cytology alone every 3 years)
        - 507385: High-risk HPV with HPV genotypes 16/18 (collect in ThinPrep, every 5 years)

Appendix D

Letter of Support

Community Medicine Foundation, Inc.

October 24, 2020

The University of Alabama
Capstone College of Nursing
650 University Blvd E
Tuscaloosa, AL 35401

To Whom it May Concern:

I am writing to you as the Chief Executive Officer of Community Medical Foundation dba North Central Family Medical Center. I fully support the implementation of Laureal's DNP project titled "Improving Attitudes and Beliefs of Cervical Cancer Screening Guidelines Through an Evidence-based Quality Improvement Project".

Our clinic has implemented a thorough COVID-19 policy that requires the use of masks while inside the building (staff are provided KN95/N95 masks, patients and visitors must have face coverings), outlines entrance screening procedures, and details measures regarding COVID exposures/cases.

Feel free to contact me at 803-325-1102 or ernestbrown@ncfmc.net if I can provide any additional information.

Sincerely,

Ernest G. Brown
Chief Executive Officer

North Central Family Medicine • P. O. Box 28 • 1131 Saluda St • Rock Hill, SC 29730 • (803) 325-7744
Ernest G. Brown Women's & Pediatric Center • 1140 Saluda St • Rock Hill, SC 29730 • (803) 325-7744
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Appendix E

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Institution name	The University of Alabama
Expected presentation date	Aug 2021
Portions	Table 1, Cx3 Study provider survey (survey instrument) on page 420.
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Author: Robin L. Hills, Pamela A. Kulbok, Myra Clark
Publication: Health Promotion Practice
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Appendix F

Pre-intervention/Baseline Survey

What is your age?

1. <35
2. 35-50
3. >50

What is your gender?

1. Male
2. Female
3. Choose not to answer

What is your race/ethnicity?

1. Hispanic or Latino
2. American Indian or Alaska Native
3. Asian
4. Black or African American
5. Native Hawaiian or Other Pacific Islander
6. Caucasian or White
7. Multiracial
8. Other
9. Prefer not to say

What type of academic degree do you hold?

1. MD/DO
2. PA
3. NP
4. Other

How many years have you been in practice?

1. <5 years
2. 5-10 years
3. >10 years

What is your primary specialty?

1. Family practice/Adult Medicine
2. Internal Medicine
3. Obstetrics/Gynecology/Women's Health
4. Other

For your female patients aged 30 years and older, how often do you use HPV testing:

	Never	Sometimes	About half the time	Usually	Always
With the Pap test for routine cervical cancer screening; and	❑	❑	❑	❑	❑
as a follow-up for an atypical squamous cells of undetermined significance (ASC-US) Pap test?	❑	❑	❑	❑	❑

For a woman 35 years of age, indicate the next cervical cancer screening interval you would be most likely to recommend for her next test given:

	<1 year	1 year	2 years	3 years	>3 years
A normal Pap this visit, negative HPV test this visit; and	❑	❑	❑	❑	❑
Normal Pap this visit, positive HPV this visit.	❑	❑	❑	❑	❑

Please indicate the extent to which you feel that the following individuals or entities encourage or discourage you to conduct HPV testing along with Pap testing for routine screening in women aged 30 years and older:

	Strongly discourage	Discourage	Neither	Encourage	Strongly encourage
Patients	❑	❑	❑	❑	❑

Colleagues	❑	❑	❑	❑	❑
Administration	❑	❑	❑	❑	❑
Professional health organizations	❑	❑	❑	❑	❑
Professional specialty organizations	❑	❑	❑	❑	❑
Professional journals	❑	❑	❑	❑	❑

Please indicate the extent to which the following individuals or entities encourage or discourage you to extend the screening interval to 5 years between tests for women aged 30 years and older with a normal Pap result and a negative HPV test:

	Strongly discourage	Discourage	Neither	Encourage	Strongly encourage
Patients	❑	❑	❑	❑	❑
Colleagues	❑	❑	❑	❑	❑
Administration	❑	❑	❑	❑	❑
Professional health organizations	❑	❑	❑	❑	❑
Professional specialty organizations	❑	❑	❑	❑	❑
Professional journals	❑	❑	❑	❑	❑

Conducting HPV testing along with Pap testing for routine screening in women aged 30 years and older is...

	Extremely good, easy, or beneficial	Quite good, easy, or beneficial	Neither	Quite bad, difficult, or harmful	Extremely bad, difficult, or harmful
GOOD versus BAD	❑	❑	❑	❑	❑
EASY versus DIFFICULT	❑	❑	❑	❑	❑
BENEFICIAL versus HARMFUL	❑	❑	❑	❑	❑

Deciding to extend the cervical cancer screening interval to 3 or more years because a woman aged 30 years and older had received a normal Pap result and negative HPV test would be...

	Extremely good, easy, or beneficial	Quite good, easy, or beneficial	Neither	Quite bad, difficult, or harmful	Extremely bad, difficult, or harmful
GOOD versus BAD	❑	❑	❑	❑	❑
EASY versus DIFFICULT	❑	❑	❑	❑	❑
BENEFICIAL versus HARMFUL	❑	❑	❑	❑	❑

To what extent do you consider the following factors in deciding whether or not to extend the cervical cancer screening interval for women aged 30 years and older?

	Not at all	Some	A great deal
History of abnormal test results	❑	❑	❑

Current HPV status	❑	❑	❑
Immune system status	❑	❑	❑
Current Pap test results	❑	❑	❑
STD/STI history	❑	❑	❑
Current number of sexual partners	❑	❑	❑
Lifetime number of sexual partners	❑	❑	❑
Cigarette smoking	❑	❑	❑
History of regular Pap screening	❑	❑	❑
Diethylstilbestrol (DES) exposure	❑	❑	❑
Patient not returning for future screening	❑	❑	❑
Patient age	❑	❑	❑
Patient educational level	❑	❑	❑
Patient race/ethnicity	❑	❑	❑
Language barrier	❑	❑	❑
Type of insurance	❑	❑	❑
Number of children	❑	❑	❑
Patient income	❑	❑	❑
Using birth control for a long time	❑	❑	❑

For a woman aged 30 years and older with a normal Pap result and a negative HPV test, please indicate the extent to which you agree or disagree with the following statements about extending the screening interval to 3 or more years between tests.

	Strongly disagree	Disagree	Neither	Agree	Strongly Agree
Takes too much time to explain interval to patient	❑	❑	❑	❑	❑
Ability to reduce patient worries about acquiring cervical cancer	❑	❑	❑	❑	❑
Fear that interval will result in higher rates of cervical precancer	❑	❑	❑	❑	❑
Interval puts patient at increased risk for cervical cancer	❑	❑	❑	❑	❑
Interval decreases care provided to the patient	❑	❑	❑	❑	❑
Interval puts me and the practice at risk for liability if the patient's next result is abnormal	❑	❑	❑	❑	❑
Interval increases patient concerns about missing cervical cancer	❑	❑	❑	❑	❑

Interval causes patient to lose contact with medical care system	❑	❑	❑	❑	❑
Interval helps reduce health care costs	❑	❑	❑	❑	❑
Interval results in patient not visiting annually for other screening tests	❑	❑	❑	❑	❑

Appendix G

Post-intervention Survey

For your female patients aged 30 years and older, how often do you use HPV testing:

	Never	Sometimes	About half the time	Usually	Always
With the Pap test for routine cervical cancer screening; and	❑	❑	❑	❑	❑
as a follow-up for an atypical squamous cells of undetermined significance (ASC-US) Pap test?	❑	❑	❑	❑	❑

For a woman 35 years of age, indicate the next cervical cancer screening interval you would be most likely to recommend for her next test given:

	<1 year	1 year	2 years	3 years	>3 years
A normal Pap this visit, negative HPV test this visit; and	❑	❑	❑	❑	❑
Normal Pap this visit, positive HPV this visit.	❑	❑	❑	❑	❑

Please indicate the extent to which you feel that the following individuals or entities encourage or discourage you to conduct HPV testing along with Pap testing for routine screening in women aged 30 years and older:

	Strongly discourage	Discourage	Neither	Encourage	Strongly encourage
Patients	❑	❑	❑	❑	❑
Colleagues	❑	❑	❑	❑	❑
Administration	❑	❑	❑	❑	❑
Professional health organizations	❑	❑	❑	❑	❑
Professional specialty organizations	❑	❑	❑	❑	❑
Professional journals	❑	❑	❑	❑	❑

Please indicate the extent to which the following individuals or entities encourage or discourage you to extend the screening interval to 5 years between tests for women aged 30 years and older with a normal Pap result and a negative HPV test:

	Strongly discourage	Discourage	Neither	Encourage	Strongly encourage
Patients	❑	❑	❑	❑	❑
Colleagues	❑	❑	❑	❑	❑
Administration	❑	❑	❑	❑	❑

Professional health organizations	❑	❑	❑	❑	❑
Professional specialty organizations	❑	❑	❑	❑	❑
Professional journals	❑	❑	❑	❑	❑

Conducting HPV testing along with Pap testing for routine screening in women aged 30 years and older is...

	Extremely good, easy, or beneficial	Quite good, easy, or beneficial	Neither	Quite bad, difficult, or harmful	Extremely bad, difficult, or harmful
GOOD versus BAD	❑	❑	❑	❑	❑
EASY versus DIFFICULT	❑	❑	❑	❑	❑
BENEFICIAL versus HARMFUL	❑	❑	❑	❑	❑

Deciding to extend the cervical cancer screening interval to 3 or more years because a woman aged 30 years and older had received a normal Pap result and negative HPV test would be...

	Extremely good, easy, or beneficial	Quite good, easy, or beneficial	Neither	Quite bad, difficult, or harmful	Extremely bad, difficult, or harmful
GOOD versus BAD	❑	❑	❑	❑	❑
EASY versus DIFFICULT	❑	❑	❑	❑	❑
BENEFICIAL versus HARMFUL	❑	❑	❑	❑	❑

To what extent do you consider the following factors in deciding whether or not to extend the cervical cancer screening interval for women aged 30 years and older?

	Not at all	Some	A great deal
History of abnormal test results	❑	❑	❑
Current HPV status	❑	❑	❑
Immune system status	❑	❑	❑
Current Pap test results	❑	❑	❑
STD/STI history	❑	❑	❑
Current number of sexual partners	❑	❑	❑
Lifetime number of sexual partners	❑	❑	❑

Cigarette smoking	❑	❑	❑
History of regular Pap screening	❑	❑	❑
Diethylstilbestrol (DES) exposure	❑	❑	❑
Patient not returning for future screening	❑	❑	❑
Patient age	❑	❑	❑
Patient educational level	❑	❑	❑
Patient race/ethnicity	❑	❑	❑
Language barrier	❑	❑	❑
Type of insurance	❑	❑	❑
Number of children	❑	❑	❑
Patient income	❑	❑	❑
Using birth control for a long time	❑	❑	❑

For a woman aged 30 years and older with a normal Pap result and a negative HPV test, please indicate the extent to which you agree or disagree with the following statements about extending the screening interval to 3 or more years between tests.

	Strongly disagree	Disagree	Neither	Agree	Strongly Agree
Takes too much time to explain interval to patient	❑	❑	❑	❑	❑
Ability to reduce patient worries about acquiring cervical cancer	❑	❑	❑	❑	❑
Fear that interval will result in higher rates of cervical precancer	❑	❑	❑	❑	❑
Interval puts patient at increased risk for cervical cancer	❑	❑	❑	❑	❑
Interval decreases care provided to the patient	❑	❑	❑	❑	❑
Interval puts me and the practice at risk for liability if the patient's next result is abnormal	❑	❑	❑	❑	❑
Interval increases patient concerns about missing cervical cancer	❑	❑	❑	❑	❑
Interval causes patient to lose contact with medical care system	❑	❑	❑	❑	❑
Interval helps reduce health care costs	❑	❑	❑	❑	❑
Interval results in patient not visiting annually for other screening tests	❑	❑	❑	❑	❑

How easy or difficult to follow do you perceive the updated cervical cancer screenings to be?

1. Very easy
2. Easy
3. Neutral
4. Difficult
5. Very difficult

How likely are you to adhere to the most updated cervical cancer screening guidelines?

1. Very likely
2. Likely
3. Neutral
4. Unlikely
5. Very unlikely

How likely are you to research potential updates/changes to the cervical cancer screening guidelines on your own (without a prompt from the CMO/clinical staff)?

1. Very likely
2. Likely
3. Neutral
4. Unlikely
5. Very unlikely

Appendix H

Timeline

Month	Progress
January 2021	**IRB approval granted. Participants will be recruited and complete the pre-intervention survey.**
February-April 2021	**The educational interventions, clinical protocol, and clinical decision-making tool will be introduced to participants.**
April 2021	**The post-intervention survery will be provided to the participants.**
April- June 2021	**Data analysis, results, dissemination, and manuscript will be evaluated, analyzed, and completed during this time.**

Appendix I

IRB Deferment Letter

Community Medicine Foundation, Inc.

October 28, 2020

The University of Alabama
650 University Blvd. E
Tuscaloosa, AL 35401

Dear UA Institutional Review Board:

I am writing to you as the Chief Executive Officer of Community Medical Foundation dba North Central Family Medical Center on behalf of Laureal J. Anderson, DNP student at the University of Alabama Capstone College of Nursing. The project entitled "Improving Attitudes and Beliefs of Cervical Cancer Screening Guidelines Through an Evidence-based Quality Improvement Project" is scheduled to be completed at our facility. We grant site approval for the project, but we do not have an IRB in place. We want to defer the IRB approval process for the protection of human subjects to the University of Alabama.

Feel free to contact me at 803-325-1102 or ernestbrown@ncfmc.net if I can provide any additional information.

Sincerely,

Ernest G. Brown

Ernest G. Brown
Chief Executive Officer

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